# UNITED STATES PATENT AND TRADEMARK OFFICE

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/967,009 | 09/28/2001 | Ashok N. Rudrapatna | 21-1 | 5654 |

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Docket Administrator (Room 3J-219)
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| EXAMINER |
|---|
| BAKER, STEPHEN M |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2133 | |

DATE MAILED: 06/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | Application No. | Applicant(s) |
|---|---|---|
| **Office Action Summary** | 09/967,009 | RUDRAPATNA ET AL. |
| | Examiner | Art Unit | |
| | Stephen M. Baker | 2133 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**.          2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
  closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-21* is/are pending in the application.

  4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

  a)☐ All  b)☐ Some * c)☐ None of:

  1.☐ Certified copies of the priority documents have been received.

  2.☐ Certified copies of the priority documents have been received in Application No. _____.

  3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
    application from the International Bureau (PCT Rule 17.2(a)).

  * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
  Paper No(s)/Mail Date <u>090302, 020204</u>.

4)☐ Interview Summary (PTO-413)
  Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

## DETAILED ACTION

### *Specification*

1.      The abstract of the disclosure is objected to because: "A method of retransmitting multiple error coded streams" apparently should read as "A method of retransmitting multiple error (control) coded streams".

Correction is required.  See MPEP § 608.01(b).

2.      The disclosure is objected to because of the following informalities:

In [0035]:  "error correction step (12)" apparently should be "error detection step (12)"; "the step of is error detection" apparently should be "the step of error detection".

In [0038]:  "If, on the other *hands, a* NACK is sent, the failed error coded *streams* are processed" is unclear.

In [0040]:  "streams comprises a Chase protocol" apparently should be "streams comprises a Chase protocol packet(s)".

Despite the presence of feedback connections shown from the channel decoders (CRC decoders and/or Chase/IR combining decoders) to the MIMO decoders in Figs. 3 and 4, there is no definite disclosure of any interaction between channel coding/decoding and MIMO coding/decoding, and consequently no explanation of how the shown feedback connections would be used, and instead the MIMO layer functions appear to be completely transparent to the "error" (channel control coding) layer functions.  The disclosure does not address the treatment of mixed "confirmations" for the streams.

***Drawings***

3.     The drawings are objected to because the flowcharts in Figures 1 and 2 appear

to be incorrect and incompatible with the architectures shown in Figs 3 and 4.  A

proposed drawing correction or corrected drawings are required in reply to the Office

action to avoid abandonment of the application.  The objection to the drawings will not

be held in abeyance.

The flowcharts of Figures 1 and 2 do not appear to be serious attempts at

representing a system with a HARQ coding advantage or at matching the architectures

of Figs. 3 or 4.  With respect to the HARQ encoder/transmitter flowchart of Fig. 1, a

multiple confirmation embodiment (multiple CRCs per block) is not addressed at all,

including the case of mixed confirmations, and so the flowchart is considered germane

only to the architecture of Fig. 3 wherein there is only one CRC per block.  There is,

incorrectly, no apparent exit from the routine, and the decision "ACK" at step 40

apparently  should exit the routine for the block.  Steps 50 and 60 apparently should be

removed, and "NACK" at step 40 apparently should couple directly to step 70, instead.

"Forming" in step 70 apparently should be "Mapping", as "forming" is presumably

completed in step 20, consistent with the architecture of Fig. 3 and the written

disclosure [0044].  With respect to the HARQ receiver/decoder flowchart of Fig. 2, a

multiple confirmation embodiment is not addressed adequately (mixed confirmations are

not addressed), and so the flowchart is considered germane only to the architecture of

Fig. 3 wherein there is only one CRC per block.  The CRC decoding and HARQ

decoding subprocesses are apparently depicted in reverse order to that required by the receiver architectures in Figs. 3 and 4. There is no step clearly assigned to packet combining for Chase and/or IR decoding. There is, incorrectly, no apparent exit from the routine.

## Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 3-9 and 14-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 3: The phrase "comprising at least one of a Chase packet and an Incremental Redundancy sub-packet" is vague in the context provided and apparently should read as "comprising at least one of a Chase packet and/or at least one of an Incremental Redundancy sub-packet".

Regarding claim 4: The phrase "the confirmation message comprises at least one of an acknowledgement message and a non-acknowledgement message" is vague in context and apparently should read as "the confirmation message comprises an acknowledgement message or a non-acknowledgement message", as there is apparently no disclosure of combining multiple ACKs and/or NACKs in a single "confirmation message".

Regarding claim 9:  No further definite limit to the depended-upon claim is apparent, as the listed options are exhaustive.

Regarding claim 14:  The phrase "comprising at least one of a Chase packet and an Incremental Redundancy sub-packet" is vague in the context provided and apparently should read as "comprising at least one of a Chase packet and/or at least one of an Incremental Redundancy sub-packet".

Regarding claim 15:  Necessary steps of HARQ packet combining have been omitted and error detection is apparently recited as being performed on individual packets, rather than on combined packets as suggested by the architectures of Figs. 3 and 4.  The phrase "the acknowledgement message transmitted if at least one of the Chase packet and the Incremental Redundancy sub-packet of the two error coded streams passes the step of cyclic redundancy checking" is vague in context and apparently should read as "an acknowledgement message is transmitted if at least one of a combined Chase packet or at least one of a combined Incremental Redundancy sub-packet of the at least two error coded streams passes the step of cyclic redundancy checking".

Regarding claim 16:  The phrase "performing cyclic redundancy checking on at least one of the Chase packet and another Incremental redundancy sub-packet" apparently should read as "performing cyclic redundancy checking on at least one combined packet including the at least one Chase packet and/or performing cyclic redundancy checking on at least one combined packet including another at least one Incremental redundancy sub-packet".

Regarding claim 17: The phrase "the non-acknowledgement message transmitted if at least one of the Chase packet and the Incremental Redundancy sub-packet of the at least two error coded streams fails the step of cyclic redundancy checking" is vague in context and apparently should read as "the non-acknowledgement message is transmitted if at least one of a combined Chase packet or at least one of a combined Incremental Redundancy sub-packet of the at least two error coded streams fails the step of cyclic redundancy checking".

Regarding claim 18: The recited limitation is apparently inconsistent with the architectures of Figs 3 and 4, where the "Incremental Redundancy function" is apparently HARQ packet combining that precedes the CRC check rather than following it.

Regarding claim 19: The phrase "performing cyclic redundancy checking on at least one of the Chase packet and another Incremental Redundancy sub-packet" apparently should read as "performing cyclic redundancy checking on at least one combined packet including the at least one Chase packet and/or performing cyclic redundancy checking on at least one combined packet including another at least one Incremental redundancy sub-packet".

Regarding claim 20: The recited limitation is apparently inconsistent with the architectures of Figs 3 and 4, where the "Chase function" is apparently HARQ packet combining that precedes the CRC check rather than following it.

Regarding claim 21: The phrase "performing cyclic redundancy checking on at least one of the Chase packet and another Incremental Redundancy sub-packet"

apparently should read as "performing cyclic redundancy checking on at least one

combined packet including the at least one Chase packet and/or performing cyclic

redundancy checking on at least one combined packet including another at least one

Incremental redundancy sub-packet".

### Claim Rejections - 35 USC § 102

6.      The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7.      Claims 1-9 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S.

Patent Application Pub. No. 2003/0072285 to Onggosanusi *et al* (hereafter

Onggosanusi).

Onggosanusi discloses a hybrid ARQ system with Chase packet decoding or

Incremental Redundancy sub-packet decoding, and a plurality of transmission

antennas, the a plurality of antennas sending a plurality of "streams" for the next block

"sub-packet" or "packet" as an "error coded stream" in response to a "confirmation

message" (ACK) of a preceding block.

8.      Claims 1-4 and 7-9 are rejected under 35 U.S.C. 102(b) as being anticipated by

U.S. Patent No. 5,657,325 to Lou *et al* (hereafter Lou).

Lou discloses a hybrid ARQ system with Incremental Redundancy sub-packet

coding (col. 2, line 55) and a plurality of transmission antennas (Fig. 4), each antenna

carrying a separate copy of the next block "sub-packet" as an "error coded stream" in

response to a "confirmation message" (ACK) of a preceding block.

9.      Claims 1, 3-11 and 13-21 are rejected under 35 U.S.C. 102(e) as being

anticipated by U.S. Patent No. 6,101,168 to Chen *et al* (hereafter Chen).

Chen discloses a hybrid ARQ system with Chase packet decoding or Incremental

Redundancy sub-packet decoding, and a plurality of transmission channels, the plurality

of channels carrying a plurality of "streams" for the next block "sub-packet" or "packet"

as an "error coded stream" in response to a "confirmation message" (ACK) of a

preceding block.  A next packet can be transmitted on one channel at the same time as

a previous packet is transmitted on another channel, and each packet is independently

error-checked by a CRC.


### Claim Rejections - 35 USC § 103

10.     Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen.

Chen does not disclose multiple receiving antennas.  Official notice is given that

the reliability advantage of using multiple receiving antennas was well known at the time

the invention was made.  It would have been obvious to a person having ordinary skill in

the art to modify Chen's system by using multiple receiving antennas.  Such a

modification would have been obvious because the reliability advantage of using multiple receiving antennas was already well known.

## *Conclusion*

11.     The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

12.     Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen M. Baker whose telephone number is (703) 305-9681.  The examiner can normally be reached on Monday-Friday (11:00 AM - 7:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert DeCady can be reached on (703) 305-9595.  The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system.  Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Stephen M. Baker
Primary Examiner
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smb